



Checklist of checkered beetles (Coleoptera, Cleridae) from Sakartvelo (Georgia)

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Abstract

A list of 18 species of checkered beetles is given, together with images of voucher specimens and a distribution map based on literature, dry collections and databases.

Key words

CaBOL, fauna, Insecta, occurrence data

Introduction

Checkered beetles (Coleoptera: Cleridae) are a member of the superfamily Cleroidea, with about 3,500 species described worldwide. Most often, checkered beetles are found on flowers in moist and sunny environments or under tree barks (McNamara 1991). Checkered beetles mainly represent phytophagous animals, although there are also zoophagous forms known, and some species feed on animal carcasses (e.g., *Trichodes apiarius* (Linnaeus, 1758) is known as a scavenger of bee hives).

Knowledge of checkered beetle diversity in Georgia remains poor. One of the first lists of Caucasian checkered beetles published by Radde (1899) reported four species for Georgia. Later on, Zaitsev (1915) updated the list for the country to 16 species. Lastly, Japoshvili et al. (2022) provided three species of Cleridae from the Lagodekhi Protected Areas. So far, 18 species have been reported from Georgia (Tarkhnishvili et al. 2013). However, species distribution data as well as actual species diversity are still very sporadic and incomplete.

Here we comprehensively summarize the existing data for the checkerid beetle species found in Georgia and provide new occurrence data for some of the species.

Materials and methods

Various published articles and online databases for beetles in the Caucasus and Georgia were checked. The curated databases GBIF (Global Biodiversity Information Facility) (GBIF Secretariat 2023) and GBD (Georgian Biodiversity Database) (Tarkhnishvili et al. 2013) were used for collecting occurrences. Dry entomological collections of the Institute of Zoology of Ilia State University (ISUZI) were studied for old, unpublished material. Data used from GBIF and CaBOL (Caucasus Barcode of Life) (<https://ggbc.eu/data>) is cited in the given paper using unique IDs. Identification of CaBOL material was performed using the identification keys of Richter (1965) and Krivolutskaya (1992).

In Georgia, social media proved to be a useful tool for collecting biodiversity data (Iankoshvili and Tarkhnishvili 2021). We used the Facebook page “Wildlife of Georgia” as a complementary source (WGFB) as well as the international citizen science platform iNaturalist (<https://inaturalist.ca/>) to retrieve the data. For several records, we were unable to retrieve the collecting date as it was not specified in the publication, nor did we have access to the actual material. The taxonomy was validated using GBIF.

The locations for the beetles recorded in older articles are not precise, in which case the sampling locations were geo-referenced using Google Earth Pro (v.7.3.6) with varying accuracy (Fig. 1).

Abbreviations for collecting methods are as follows: HC = Hand Collection; SwN = Sweeping Net. The genera and species in the checklist are listed alphabetically. Taxonomy is according to the Catalogue of Palaearctic Coleoptera (Löbl and Rolcik 2007). For species with vague occurrence data, we used “location is not defined”.

Results

Family Cleridae

Genus *Clerus* Geoffroy, 1762

1. *Clerus mutillarius* Fabricius, 1775

GEORGIA • Location is not defined (Löbl and Rolcik 2007).

Genus *Denops* Fischer Von Waldheim, 1829

2. *Denops albofasciatus* (Charpentier, 1825)

GEORGIA • Surami (Shida Kartli region); N42.02°, E43.55°; Zaitsev (1915).

Genus *Dermestoides* Houlbert & Bétis, 1905

3. *Dermestoides sanguinicollis* (Fabricius, 1787)

GEORGIA • Location is not defined (Löbl and Rolcik 2007).

Genus *Korynetes* Herbst, 1792

4. *Korynetes caeruleus* (De Geer, 1775)

GEORGIA • Borjomi (Samtskhe-Javakheti region); N41.83°, E43.38°; Radde 1899. • Manglisi (Kvemo Kartli region); N41.70°, E44.37°; Zaitsev 1915. • 2 inds; Atskuri (Samtskhe-Javakheti region); N41.73°, E43.16°; 11 June 1895; Zaitsev 1915. • 3 inds; Bakuriani (Samtskhe-Javakheti region); N41.74°, E43.53°; June 1910; Zaitsev 1915. • 1 ind; Telavi (Kakheti region); N41.91°, E45.47°; April 1907; Zaitsev 1915.

Genus *Necrobia* Olivier,

5. *Necrobia rufipes* (Fabricius, 1781)

GEORGIA • 8 inds; Tbilisi; N41.72°, E44.79°; September-October 1904; Zaitsev 1915.

6. *Necrobia violacea* (Linnaeus, 1758)

GEORGIA • 15 inds; Telavi (Kakheti region); N41.91°, E45.47°; March 1907; Zaitsev 1915. • 2 inds; Tbilisi; N41.72°, E44.79°; 12 April 1905; Zaitsev 1915. • Mtskheta (Mtskheta-Mtianeti region); N41.84°, E44.71°; 19 May 1905; Zaitsev 1915. • Tana (Ateni gorge, Shida Kartli region); N41.89°, E44.01°; Zaitsev 1915. • 1 ind; Saghamo lake (Samtskhe-Javakheti region); N41.2941°, E43.7309°; 2006 m a.s.l.; 11 October 2021; leg. A. Seropian; Japarashvili et al. 2023.

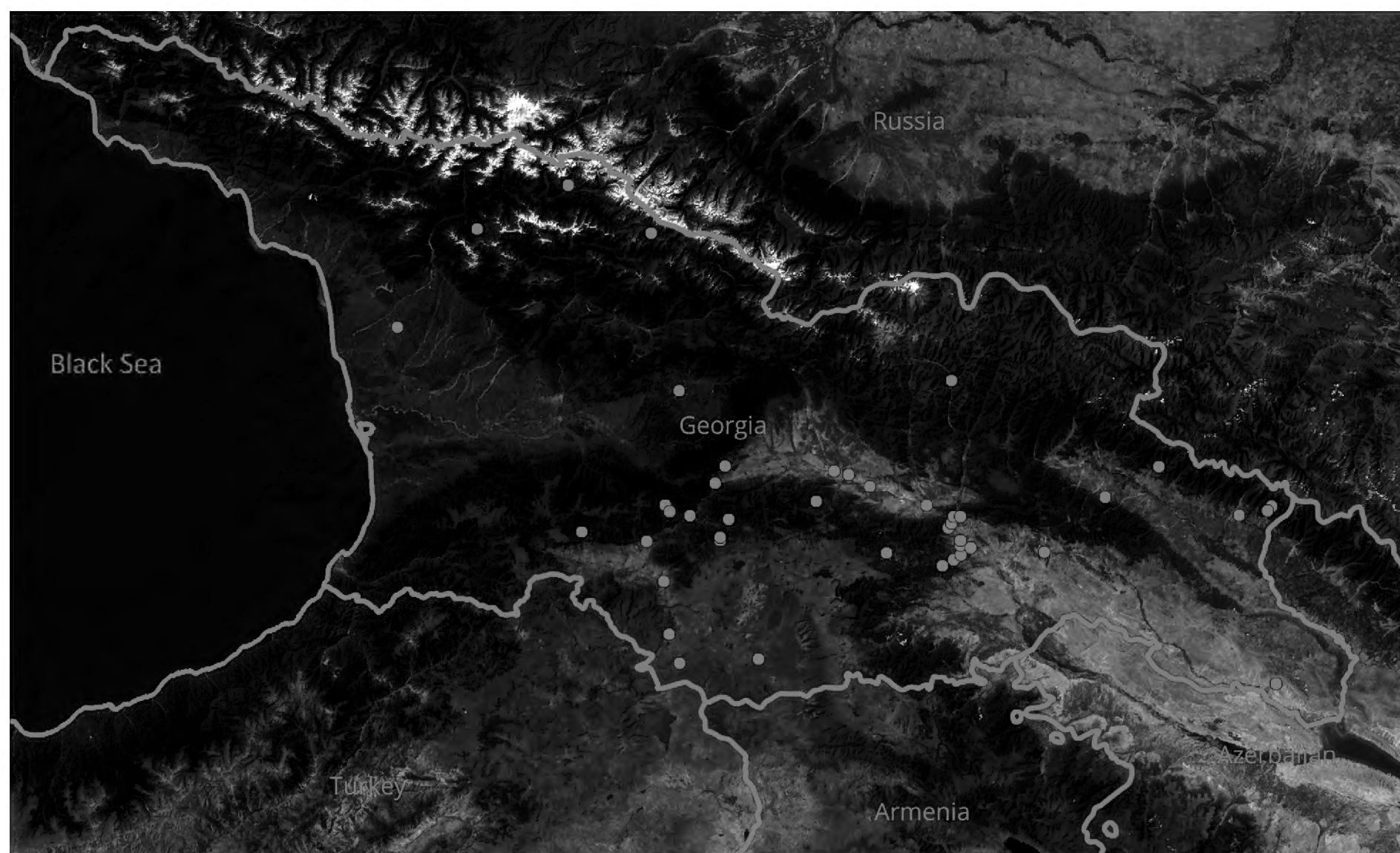


Figure 1. A map of Georgia shows the localities (coordinates are given in the check-list under each of the listed species) where Cleridae materials are collected (ESRI Satellite, ArcGIS/World_Imagery).

Genus *Opetiopalpus* Spinola, 1844**7. *Opetiopalpus scutellaris* (Panzer, 1797)**

GEORGIA • Tbilisi; N41.72°, E44.79°; Zaitsev 1915.

Genus *Opilo* Latreille, 1802**8. *Opilo domesticus* (Sturm, 1837)**

GEORGIA • Surami (Shida Kartli region); N42.02°, E43.55°; Radde 1899.

9. *Opilo mollis* (Linnaeus, 1758)

Fig. 2A

GEORGIA • Surami (Shida Kartli region); N42.02°, E43.55°; Zaitsev 1915. • Tana (Ateni gorge) (Shida Kartli region); N41.89°, E44.01°; Zaitsev 1915. • Borjomi (Samtskhe-Javakheti region); N41.83°, E43.38°; 8 June 1910; Zaitsev 1915. • 3 inds; Lagodekhi (Kakheti region); N41.8715°, E46.3115°; 1351 m a.s.l.; 4–14 June 2014; Japoshvili et al. 2022. • 1 ind; Lagodekhi (Kakheti region); N41.8715°, E46.3115°; 1351 m a.s.l.; 4–14 June 2014; 14

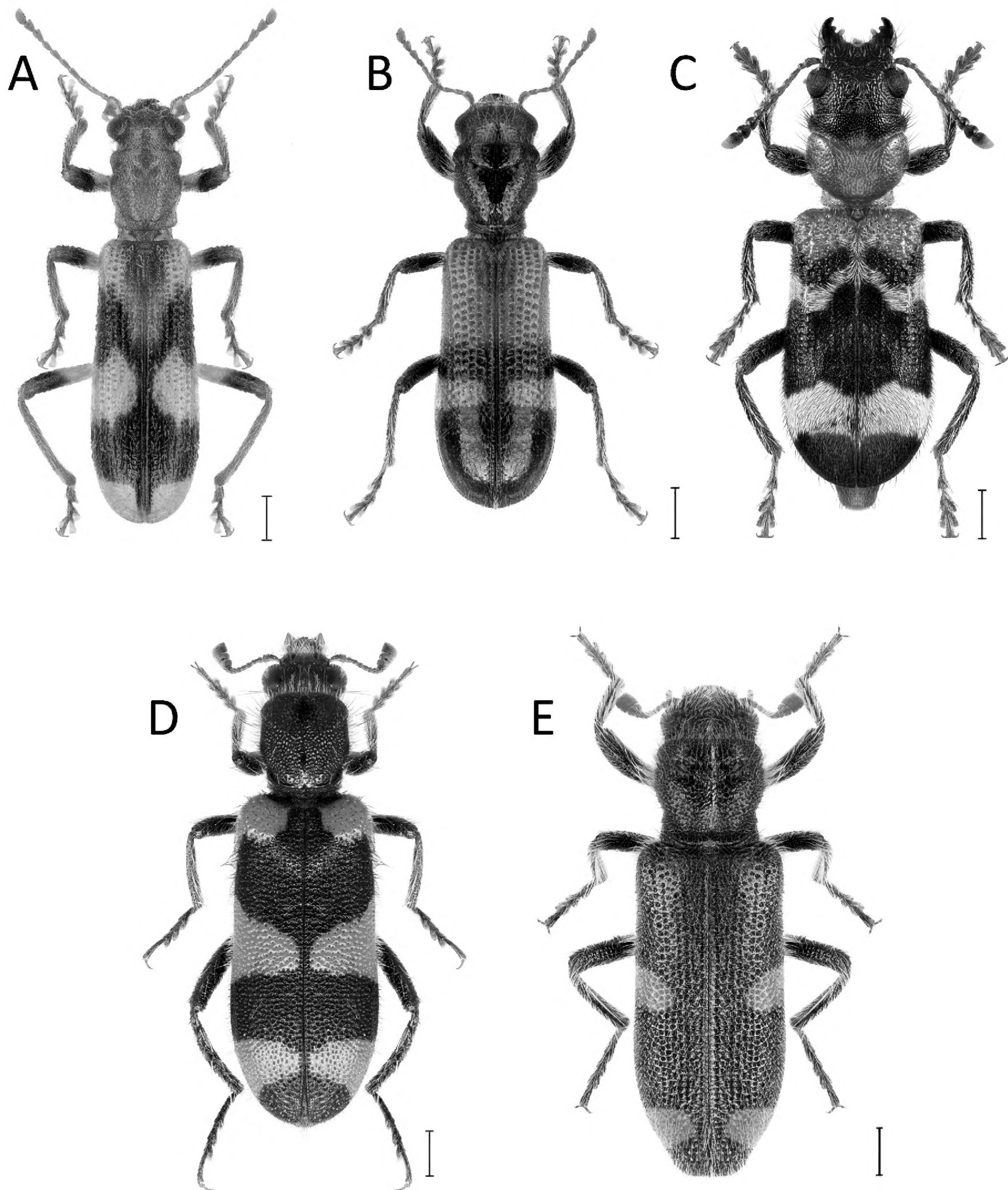


Figure 2. A: *Opilo mollis* (Linnaeus, 1758), CaBOL-ID 1010268. B: *Opilo taeniatus* (Klug, 1842), CaBOL-ID 1010301. C: *Thanasimus formicarius* (Linnaeus, 1758), CaBOL-ID 1009787. D: *Trichodes punctatus* (Fischer von Waldheim, 1829), specimen from Kiketi. E: *Trichodes quadriguttatus* (Adams, 1817), specimen from Gori. Scale bars = 1 mm.

June / 5 July 2014; Japoshvili et al. 2022. • 1 ind; Udzo (Kojori, Tbilisi municipality); N41.6763°, E44.7009°; 1408 m a.s.l.; 17 June 2021; HC; deciduous forest; CaBOL-ID: CaBOL-1010268.

10. *Opilo taeniatus* (Klug, 1842)

Fig. 2B

GEORGIA • 3 inds; Tbilisi; N41.72°, E44.79°; 8 May 1903, 30 May 1905, 2 June 1906; Zaitsev 1915. • 1 ind; Gori (Kvernaki ridge, Shida Kartli region); N41.9938°, E44.1733°; 848 m a.s.l.; 30 May 2021; SwN; leg. A. Seropian; CaBOL-ID: CaBOL-1010301. • 1 ind; Gori (Kvernaki ridge, Shida Kartli region); N41.9938°, E44.1733°; 848 m a.s.l.; 24 June 2021; HC; leg. N. Bulbulashvili; CaBOL-ID: CaBOL-1010307.

Genus *Thanasimus* Spinola, 1844

11. *Tarsostenus univittatus* (Rossi, 1790)

GEORGIA • Tbilisi; N41.72°, E44.79°; Zaitsev 1915.

Genus *Tarsostenus* Latreille, 1806

12. *Thanasimus femoralis* (Zetterstedt, 1828)

Syn. *Clerus rufipes* Brahm, 1797

GEORGIA • 1 ind; Borjomi (Samtskhe-Javakheti region); N41.83°, E43.38°; Zaitsev 1915. • Bakuriani (Samtskhe-Javakheti region); N41.75°, E43.53°; Zaitsev 1915. • 4 inds; Bozali (Samtskhe-Javakheti region); N41.2714°, E43.3379°; 1866 m a.s.l.; 6 June 2022; SwN; Subalpine meadow; leg. L-G. Japaridze; CaBOL-IDs: CaBOL-1025798, CaBOL-1025799, CaBOL-1025800, CaBOL-1025801.

13. *Thanasimus formicarius* (Linnaeus, 1758)

Fig. 2C

GEORGIA • Lomismta Mt. (Borjomi, Samtskhe-Javakheti region); N41.87°, E43.25°; Radde 1899. • Borjomi (Samtskhe-Javakheti region); N41.83°, E43.38°; Zaitsev 1915. • Mtskheta, (Mtskheta-Mtianeti region); N41.84°, E44.71°; Zaitsev 1915. • 4 inds; Bakuriani (Samtskhe-Javakheti region); N41.74°, E43.53°; 19 June 1910, 25 May 1911; leg. L. Młokosiewicz; May-August 1912, 1 June 1913; leg. Kozlovsky; Zaitsev 1915. • Telavi (Kakheti region); N41.91°, E45.47°; April 1907; leg. Fursov; Zaitsev 1915. • Lagodekhi (Kakheti region); N41.87°, E46.31°; 23 May 1910; leg. L. Młokosiewicz; Zaitsev 1915. • Zeda Vedi (previously known as Umroni) (Samegrelo-Zemo Svaneti region); N42.89°, E42.26°; 10 July 1911; Zaitsev 1915. • 1 ind; Lagodekhi (Kakheti region); N41.8715°, E46.3115°; 1351 m a.s.l.; 5-15 May 2014; Japoshvili et al. 2022. • 1 ind; Lagodekhi (Kakheti region); N41.8525°, E46.2878°; 666 m a.s.l.; 1 May / 14 June 2014; Japoshvili et al. 2022. • 1 ind; Lagodekhi (Kakheti region); N41.8715°, E46.3115°; 1351 m a.s.l.; 15-25 May 2014; Japoshvili et al. 2022. • 1 ind; Telovani (Tbilisi); N41.8009°, E44.6807°; 888 m a.s.l.; 2 April 2022; under the bark in deciduous forest; HC; leg. N. Bulbulashvili; CaBOL-ID 1023282. • 1 ind;

Telovani (Tbilisi); N41.8143°, E44.6938°; 990 m a.s.l.; 16 November 2020; mixed broadleaf forest, predominantly *Carpinus caucasica*; HC; leg. A. Seropian; CaBOL-ID: CaBOL-1009787.

Genus *Tilloidea* Laporte, 1833

14. *Tilloidea unifasciata* (Fabricius, 1787)

GEORGIA • Borjomi (Samtskhe-Javakheti region); N41.83°, E43.38°; Zaitsev 1915.

Genus *Tillus* Olivier, 1790

15. *Tillus elongatus* (Linnaeus, 1758)

GEORGIA • Zugdidi (Samegrelo-Zemo Svaneti region); N42.51° E41.87°; Zaitsev 1915. • Borjomi (Samtskhe-Javakheti region); N41.83°, E43.38°; Zaitsev 1915. • Eldari stepps (Kakheti region); N41.20°, E46.32°; Zaitsev 1915. • 1 ind; Lagodekhi (Kakheti region); N41.8715°, E46.3115°; 1351 m a.s.l.; 4-14 June 2014; Japoshvili et al. 2022. • 1 ind; Lagodekhi (Kakheti region); N41.8715°, E46.3115°; 1351 m a.s.l.; 15-25 June 2014; Japoshvili et al. 2022. • 1 ind; Lagodekhi (Kakheti region); N41.8715°, E46.3115°; 1351 m a.s.l.; 14 June / 5 July 2014; Japoshvili et al. 2022.

Genus *Trichodes* Herbst, 1792

16. *Trichodes apiarius* (Linnaeus, 1758)

GEORGIA • Borjomi (Samtskhe-Javakheti region); N41.83°, E43.38°; Zaitsev 1915. • Bakuriani (Samtskhe-Javakheti region); N41.7510°, E43.5299°; Zaitsev 1915. • Tbilisi; N41.72°, E44.79°; June 1912; Zaitsev 1915. • Gvirgvina Mt. (Samtskhe-Javakheti region); N41.82°, E43.57°; 20 July 1896; leg. Satunin; Zaitsev 1915. • 2 ind; Bakuriani (Samtskhe-Javakheti region); N41.74°, E43.53°; June 1910, July 1911; leg. Satunin; Zaitsev 1915. • Pasanauri (Mtskheta-Mtianeti region); N42.35°, E44.69°; July 1913; leg. Satunin; Zaitsev 1915. • Mtskheta, Ksani (Mtskheta-Mtianeti region); N41.88°, E44.57°; June 1913; leg. Satunin; Zaitsev 1915. • Borjomi, Lomismta Mt. (Samtskhe-Javakheti region); N41.87°, E43.25°; August 1896; leg. Fursov; Zaitsev 1915. • Tana (Ateni gorge, Shida Kartli region); N41.89°, E44.01°; July 1907; leg. Fursov; Zaitsev 1915. • Teliani (Shida Kartli region); N41.95°, 44.28°; July 1907; leg. Fursov; Zaitsev 1915. • Lagodekhi (Kakheti region); N41.87°, E46.31°; June 1905; leg. L. Młokosiewicz; Zaitsev 1915. • Chikauri (Imereti region); N42.30°, E43.31°; July 1911; Zaitsev 1915. • Zeda Vedi (previously known as Umroni) (Samegrelo-Zemo Svaneti region); N42.89°, E42.26°; July 1911; Zaitsev 1915. • 1 ind; Shilda (Kakheti region); N42.0246°, E45.7422°; 591 m a.s.l.; 28 July 2015; leg. G. Ianqoshvili; Tarkhnishvili et al. 2013. • 1 ind; Mtskheta (Mtskheta-Mtianeti region); N41.84°, E44.71°; 2 August 2020; leg. G. Nemsadze; Tarkhnishvili et al. 2013. • Aspindza (Samtskhe-Javakheti region); N41.5778°, E43.2499°; 18 July 2016; person-

al observation by Vasikoo Beridze; WGFB. • Tashiskari (Samtskhe-Javakheti region); N41.9536°, E43.5010°; 10 July 2015; WGFB. • Tashiskari (Samtskhe-Javakheti region); N41.9536°, E43.5010°; 10 July 2015; personal observation by Zauri Khachidze; WGFB. • Abastumani (Samtskhe-Javakheti region); N41.75804°, E42.8296°; personal observation by Tatia Adamia; WGFB. • Tbilisi; N41.6958°, E44.7403°; 13 June 2017; personal observation by Lamia Strix; WGFB. • Sartichala (Gardabani, Kvemo Kartli); N41.7071°, E45.1652°; 15 June 2023; personal observation by Nika Nika; WGFB. • 1 ind; Lentekhi-Tsana road (0.7 km N of Tsana; Racha-Lechkhumi and Kvemo Svaneti region) N42.8887°, E43.1437°; 1770 m a.s.l.; 24 July 2018; Alpine meadows; leg. B. Rulik; ZFMK-TIS-8003896 (Zoological Research Museum Alexander Koenig). • 1 ind; Borjomi (Samtskhe-Javakheti region); N41.8430°, E43.2730°; 1894 m a.s.l.; 22 August 2021; leg. User 83484 (Observation.org); GBIF ID: 3722877749. • 1 ind; Mestia (Samegrelo-Zemo Svaneti region); N43.0628° E42.7214°; 2237 m.a.s.l.; 3 August 2021; leg. User 83484 (Observation.org); GBIF ID: 3722105898. • 2 inds; Bakuriani (Samtskhe-Javakheti region); N41.7510° E43.5292°; 1 August 1982; leg. R. Kuresoo (TU); GBIF ID: 3017596476, GBIF ID: 3017445492. • 1 ind; Mckheta (Mtskheta-Mtianeti region); N41.8412°, E44.7074°; 458 m a.s.l.; 25 August 1986; leg. W.J. Veldkamp (NMR); GBIF ID: 2995105316. • 1 ind; Mtskheta (Mtskheta-Mtianeti region); N41.8412°, E44.7074°; 458 m a.s.l.; 21 August 1986; leg. W.J. Veldkamp (NMR); GBIF ID: 2995102323. • 1 ind; Tbilisi; N41.7317°, E44.7400°; 547 m a.s.l.; 27 November 2018; leg. pavithra1999 (iNaturalist); GBIF ID: 2992803633. • 1 ind; Aspindza (Samtskhe-Javakheti); N41.3798°, E43.2865°; 1238 m a.s.l.; 16 June 2019; leg. F. Riegel (iNaturalist); GBIF ID: 2311394988. • 1 ind; Baisubani (Kakheti); N41.83875°, E46.145517°; 341 m a.s.l.; 6 May 2023; leg. shota_japarashvili (iNaturalist); GBIF ID: 4137672136. • 2 ind; Borjomi-Kharagauli National Park, Romanov trail hut (Samtskhe-Javakheti); N41.84055°, E43.27416°; 1901 m a.s.l.; 22 July 2006; leg. G. Chaladze; ISUZI.

17. *Trichodes punctatus* Fischer von Waldheim, 1829

Fig. 2D

GEORGIA • 1 ind; Mchkheta (Jvari monastery, Mtskheta-Mtianeti region); N41.838°, E44.733°; 616 m a.s.l.; 22 May 2019; leg. M. Szewczyk; Tarkhnishvili et al. 2013. • 1 ind; Kiketi (Tbilisi municipality); N41.65°, E44.65°; 25 May 2021; leg. A. Seropian; Tarkhnishvili et al. 2013.

18. *Trichodes quadriguttatus* Adams, 1817

Fig. 2E

GEORGIA • Tbilisi; N41.72°, E44.79°; 12 July 1912; Zaitsev 1915. • Mtskheta (Mtskheta-Mtianeti region); N41.84°, E44.71°; Zaitsev 1915. • 1 ind; Gori (Kvernaki ridge, Shida Kartli region); N42.0074°, E44.0958°; 30 May 2021; leg. A. Seropian; Tarkhnishvili et al. 2013. • 1 ind; Lisi Lake (Tbilisi); N41.7447°, E44.7408°; 19 June 2022; personal observation by Giorgi Makharadze; WGFB

Discussion

So far, the species-occurrence records were obtained mostly from the central part of Georgia. Still, the surveyed area in Georgia is very sporadic and patchy (Fig. 1). Most of the parts of the country need to be further studied to provide comprehensive distributional data for the members of the Clerida family.

Two of the species given in the checklist, *Clerus mutillarius* and *Dermestoides sanguinicollis*, were recorded in Georgia; however, there is no exact data about their localities. They were included in the checklist since the Catalogue of Palaearctic Coleoptera (Löbl and Rolcik 2007) indicates their presence in the area. Nevertheless, further research is needed to confirm their occurrence in Georgia.

In addition to the listed species, some others that are known to occur in the neighborhood of Georgia are expected to be discovered here too. For instance, *Trichodes sipylus* (Linnaeus, 1758) is distributed in Armenia, Azerbaijan, and Turkey (Zaitsev 1915; Löbl and Rolcik 2007); *T. ephippiger* (Chevrolat, 1874) and *T. longissimus* (Abeille de Perrin, 1881) are distributed in Turkey (Bulak et al. 2012); *T. persicus* Kraatz, 1894 is distributed in Armenia, Azerbaijan (Zaitsev 1915; Löbl and Rolcik 2007), with the closest occurrence recorded in Gyumri (Armenia) (Sliker et al. 2023). Thus, all these species are also expected to be found in Georgia. Nevertheless, targeted research on checkered beetles in Georgia would uncover the yet-unknown diversity and distribution patterns of this taxon.

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